No. 8900108

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

T. M. Quinn

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF eighteen YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT

'QK-77'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of* Washington, D. C. *this* 28th *day of* February *in the year of our Lord one thousand nine hundred and ninety.*

Attest:

Kenneth A. Evans
Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Clayton Yeutter
Secretary of Agriculture

APPROVAL EXPIRES 2-28-88

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

FORM APPROVED: OMB NO. 0581-0055

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

1. NAME OF APPLICANT(S)	2. TEMPORARY DESIGNATION	3. VARIETY NAME
T. M. Quinn	KAMUT QK-77 11/29/88	QK-77

4. ADDRESS (Street and No. or R.F.D. No., City, State, and Zip Code)	5. PHONE (Include area code)	FOR OFFICIAL USE ONLY
Box 353 Big Sandy, Montana 59520	(406) 378-2337	PVPO NUMBER 8900108

6. GENUS AND SPECIES NAME	7. FAMILY NAME (Botanical)	FILING
Triticum turgidium L., polonicum	Gramineae	DATE Mar 6, 1989 TIME 1:30 ☐ A.M. ☑ P.M.

8. KIND NAME	9. DATE OF DETERMINATION	FEES RECEIVED
Polish wheat	November 1986	AMOUNT FOR FILING $ 1800.00 DATE Mar. 6 1989 AMOUNT FOR CERTIFICATE $ 200.00 DATE Jan. 30 1990

10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION *(Corporation, partnership, association, etc.)*

11. IF INCORPORATED, GIVE STATE OF INCORPORATION	12. DATE OF INCORPORATION

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS

PHONE *(Include area code)*:

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED

a. ☒ Exhibit A, Origin and Breeding History of the Variety *(See Section 52 of the Plant Variety Protection Act.)*
b. ☒ Exhibit B, Novelty Statement.
c. ☒ Exhibit C, Objective Description of Variety *(Request form from Plant Variety Protection Office.)*
d. ☐ Exhibit D, Additional Description of Variety.
e. ☐ Exhibit E, Statement of the Basis of Applicant's Ownership.

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? *(See Section 83(a) of the Plant Variety Protection Act.)* ☐ Yes *(If "Yes," answer items 16 and 17 below)* ☒ No

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?	17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?
☐ Yes ☒ No	☐ Foundation ☐ Registered ☐ Certified

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?

☐ Yes *(If "Yes," give date)*

☒ No

19. HAS THE VARIETY BEEN RELEASED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?

Since May of 1988 small amounts of grain and flour have been sold into Idaho and California for product testing only.

☒ Yes *(If "Yes," give names of countries and dates)*

☐ No

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT	DATE
T. M. Quinn	3 Mar 1989
SIGNATURE OF APPLICANT	DATE

FORM LS-470 (3-86) *Edition of 7-84 obsolete.*

Attachment to Application for Plant Variety Protection Certificate
(Form GR-470) (Applicant: T. M. Quinn)

EXHIBIT A

1. The applicant is a commercial small grain producer in North Central Montana who has farmed continuously since 1948 in the same location. The Quinn family has also established a small stone flour milling operation to complement the farm activity.

2. In December of 1977, some heads of wheat and a handful of grain were given to the applicant by a friend who considered the wheat very unusual and novel. The seed was planted in a small plot in the spring of 1978, hand cultivated, rouged, harvested, and hand thrashed. The seed was graded for size, color, and shape. The kernels were very uniform and were nearly 2-3 times the size of normal hard red spring wheats. The kernels had a very distinctive hump near the germ end.

3. This first planting in 1978 yielded about 10 pounds. From this seed 5 pounds were sent to California in the fall of 1978 to increase the seed supply. The grain lodged very badly and the yield in California was disappointing with a return of about 80 pounds. Two pounds of the 1978 crop was retained as a control sample and the remainder was planted in the spring of 1979. The plot was carefully inspected during the growing season. The heads were hand collected and taken to the North Central Montana Experiment Station for thrashing. A yield of approximately 100 pounds was obtained from this planting. Careful examination of this seed showed no deviation from the control sample raised in 1978.

4. No more seed increasing was done until 1986 at which time one acre and a half was mechanically planted in an isolated strip on our farm. This planting was carefully inspected and rogued during the growing season. It was harvested by the North Central Montana Experiment Station with a resulting yield of approximately 32 bushels. Careful comparison of random samples of the seed with the control sample showed genetic stability of the grain.

5. In the fall of 1986, 60 pounds of seed was sent to Arizona to increase the supply of seed stock. The Arizona experience was similar to California with a disappointing return of only about 600 pounds.

6. A field planting of 20 acres was made in 1987 on our farm. This field was carefully watched, rogued, and harvested with our combine. Some lodging was noted. The yield on this field was approximately 30 bushels per acre and again as random samples were compared to the control sample the genetic stability was again proved.

7. In the spring of 1988 an 81 acre field was planted on our farm. Despite a severe drought experienced during the growing season, the grain had a yield of 15.5 bushels to the acre. This was a spectacular field of uniform height and color in a drought year. There was no lodging of the grain. Random samples were again compared to the control sample with no deviations noted. Two other smaller plots of approximately 20 acres near Harrison, MT, and 8 acres near Lewistown, MT, were planted. Yields were similar in those areas to our yield, and all the harvested seed was returned to us.

8. The grain has been cleaned and is stored in a steel bin on our farm. Small amounts of grain and flour (no more than 15,000 pounds total) were sent to Idaho and California starting in the late spring of 1988. This grain and flour was used for new product research and development. The products being studied were whole wheat pasta, wheat grass juice, puffed wheat, roasted wheat and bulgur wheat. In all cases agreements were made stating that no seed would be produced by any of these processors.

Attachment to Application for Plant Variety Protection Certificate
(Form GR-470) (Applicant : T. M. Quinn)

addendum to EXHIBIT A

2. (a) Background of source material.

This grain did not come from a public variety or from a public or private germplasm source. The source material came from the Mediterranean area.

In 1949 a Montana airman serving in Potugal acquired a few kernels of grain from a fellow airman. He was told that the grain came from a stone box from an excuvated Egyptian tomb, which was near the Nile river at Dashur, Egypt. The Montana airman mailed the kernels to his dad, who farmed in Chouteau County, Montana. The seed was planted, and from those that germinated, a seed increasing program was followed for about 6 years. At the end of this period the entire stock was sold for cattle feed.

2. (b) Distribution of source material.

During the 6 years propagation of the original grain many samples were given to neighbors as a novelty due to the large size of the kernels. There is no record of anyone attempting to increase the samples. Since it has been 35 years since the original stock was sold, it is improbable that any of the samples are available.

2. (c) Differences between original material and applicants variety.

The applicant was impressed by the large "humped" kernels which were selected from the original sample for planting and hand sorted in 1978 to continue the propagation of the "humped" trait. The application variety is humped in contrast to the original sample which was a mixture of striaght and humped kernels. The applicant believes that by selection of the "humped" kernels a novel and new variety has been developed.

The applicant has found no variants in the grain now being produced. No variants were found in the spring wheat breeding project at Montana State University. (See Exhibt A1)

8900108
B+A

Montana State University
Bozeman, Montana 59717-0002

Department of Plant and Soil Science
College of Agriculture

Telephone (406) 994-4601

November 7, 1986

Mr. Mac Quinn
Box 353
Big Sandy, MT 59520

Dear Mac:

The scientific name of the wheat you have been growing is Triticum turgidum. Previously this species was also known as Triticum polonicum. One common name used with this wheat is 'Polish wheat'. There are four wheats included in the species Triticum turgidum. In general, this group has kernel characteristics which you and I would associate with the Durum wheats.

All the wheats in the Triticum turgidum group have 28 chromosomes coming from two different ancestor species. They all intercross easily and have fertile progeny. This suggests that they are very closely related.

Please feel free to call me at home concerning the literature review by the firm in Seattle. It would be possible for someone here in Nutrition, that is in Home Economics, to do a literature search if you like.

Hope you have a good trip into the warm winter lands of Southern California and a safe return. Talk to you again soon. Best regards.

Sincerely,

Allan

G. Allan Taylor
Assoc. Prof. of Agronomy

sg

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MONTANA STATE UNIVERSITY

Department of Plant and Soil Science
Montana State University
Bozeman, Montana 59717-0002
406-994-4601

Exhibit A1

November 14, 1989

Mr. T. M. Quinn
Box 353
Big Sandy, MT 59520

Dear Mr. Quinn:

This letter is to confirm that the spring wheat breeding project at Montana State University evaluated your Polish wheat variety "QK-77" at eleven locations in the state of Montana. My understanding is that "QK-77" replaces "Kamut" as the name for this variety. No variance in plant type was observed at any of the eight locations that I personally visited during the growing season.

Best regards,

Luther Talbert
Spring wheat breeder

Attachment to Application for Plant Variety Protection Certificate
(Form GR-470) (Applicant: T. M. Quinn)

EXHIBIT B

1. QK-77 was identified as Triticum turgidum L., polonicum by Dr. G. Allan Taylor, Associate Professor of Agronomy Department of Plant and Soil Science at Montana State University in 1986. (see Exhibit ~~B1~~ A)

2. QK-77 is a very tall grain when compared to other wheat and durum grown on our farm. Although the stocks are large, the grain seems to lodge when grown on dry land under average moisture conditions.

3. Under below average moisture conditions the grain does much better than other grains. In our extreme drought conditions of 1988, it attained a good height for combining and out yielded our other spring grains by 2.5 to 5 times. This was achieved without the use of commercial fertilizer.

4. The kernel of QK-77 is long, plump, curved, with a very distinctive hump near the germ end. This contrasts with the description of the Polish wheat kernel as found in USDA Technical Bulletin 459, page 146, and Bulletin 1278, page 47.

5. The second major difference between QK-77 and Polish wheat as described in Bulletins 459 and 1278 is found in the manufacture of macaroni products. QK-77 produces excellent macaroni as described in texts by NDSU in 1988. (see Exhibit ~~B2~~ D) It also has a superior taste as established by taste tests of the product. The Royal Angelus Macaroni Company of Chino, California, found that it had a taste superior to all other whole wheat products which they tested. They also found that it machines well in their process and has less tendency to checking. (see Exhibit ~~B3~~ D)

Attachment to Application for Plant Variety Protection Certificate
(Form GR-470) (Applicant: T. M. Quinn)

addendum to EXHIBIT B

6. Every effort to locate a sample of 'RF-75' (Triticum polonicum) or the owner, Jack C. Futrell, were futile. The county agent, Prairie County, Burns, OR was contacted, and he stated that Jack C. Futrell had sold out, moved, and no one knew where to locate Mr. Futrell. Without permission the applicant was unable to secure a sample of 'RF-75' from the collection at Fort Collins, CO. Comparison of information from Jack C. Futrell's Plant Variety Certificate for 'RF-75' with applicants 'QK-77' shows significant differences, however.

(a) 'RF-75' has white awns. 'QK-77' has black awns. (see Exhibit B4)

(b) Jack C Futrell statement that 'RF-75' "is inferior in quality for use in bread and macaroni" contrasts to 'QK-77' which produces excellent macaroni as described in tests by NDSU in 1988 (see Exhibit B2D). 'QK-77' whole wheat pasta was determined to have superior taste in tests by Royal Angelus Macaroni Co. (see Exhibit B3D).

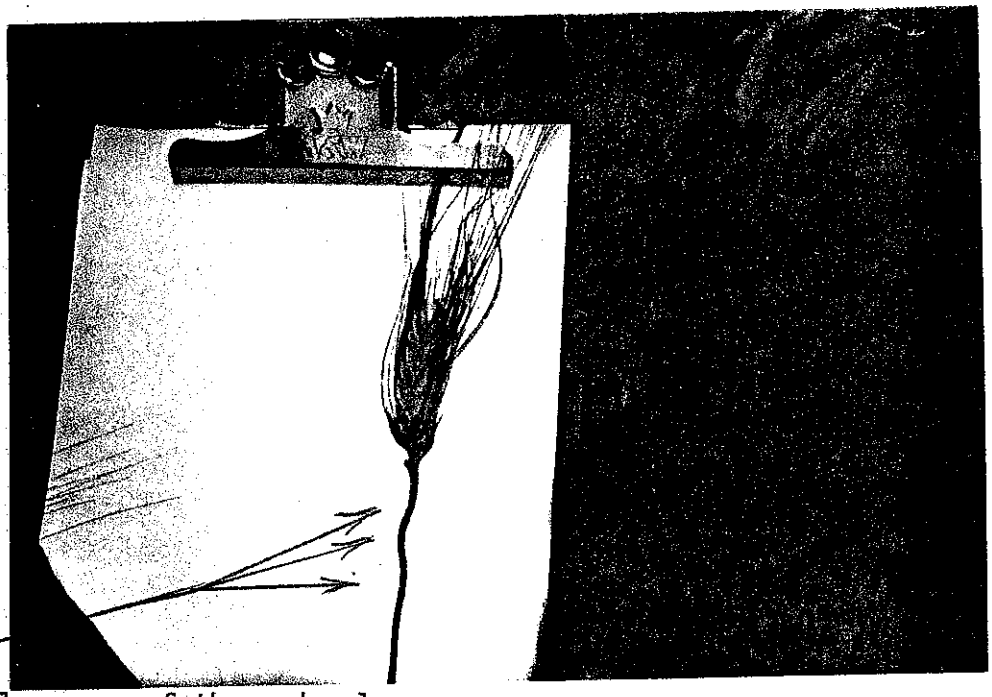
(c) The applicant's 'QK-77' is targeted for the field of human nutrition instead of livestock feed for which 'RF-75' claims superiority.

7. 'QK-77' has a tripple curve in the peduncle beginning just below the head. (see Exhibit B4).

8. Several people with severe wheat allergies have eaten 'QK-77' with no allergic reaction. This would suggest hyproallergic properties; however, this has not been clinically established.

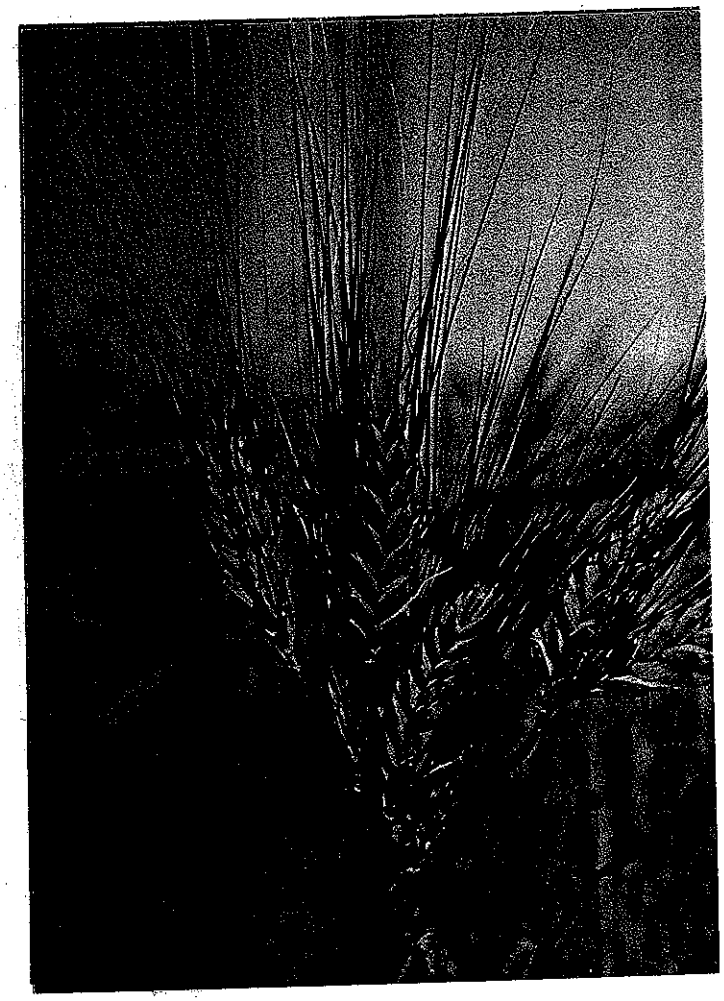
9. The applicant requested and received samples of all the Triticum polonicum in the USDA World Wheat Collection held at Aberdeen, Idaho. 50 varieties were received and carefully compared to 'QK-77'. Only one variety had some kernels similar to 'QK-77'. It was identified as follows; Accession PI - 256034, Cultivar Enano De Andujar, origin Spain. This variety contained a mixture of "Hump" and no "hump" kernels. No variety in the collection had an origin of the USA. A sample of the Enano De Andujar along with another sample of a Triticum polonicum from California was mailed to Dr. Luther Talber, Department of Plant and Soil Science, Montana State University to be compared by electrophoresis to 'QK-77'. Dr. Talbert determined that the three varities were different. (See Exhibit B5 and Exhibit B6). The electrophoresis serves as a finger print for each variety and shows 'QK-77' as a unique variety.

EXHIBIT B4



'QK-77'

Showing triple curve of the peduncle.



'QK-77'

Showing black awns

MONTANA STATE UNIVERSITY
Department of Plant and Soil Science
Montana State University
Bozeman, Montana 59717-0002
406-994-4601

April 7, 1989

EXHIBIT B5

Robert M. Quinn
Ferry Route, P. O. Box 808
Big Sandy, MT 59520

Dear Bob:

Enclosed please find an analysis of endosperm proteins in your Triticum polonicum. My interpretation of the SDS-PAGE patterns are as follows:

1. California and Kamut are not identical. Note the extra band below the highest molecular weight band in California vs. Kamut. This result was obtained a second time using different seed (2 each for California and Kamut).

2. The "Hump" vs. "No Hump" seed are also different based on SDS-PAGE. This difference is fairly obvious. These results were obtained with a single seed per type.

3. Based on the resolution of this gel, "Hump" and Kamut appear to have the same gliadin banding patterns.

Sincerely,

Luther Talbert
Spring Wheat Breeder

sg

Note: 'QK-77' replaces Kamut as the name for this variety.

10

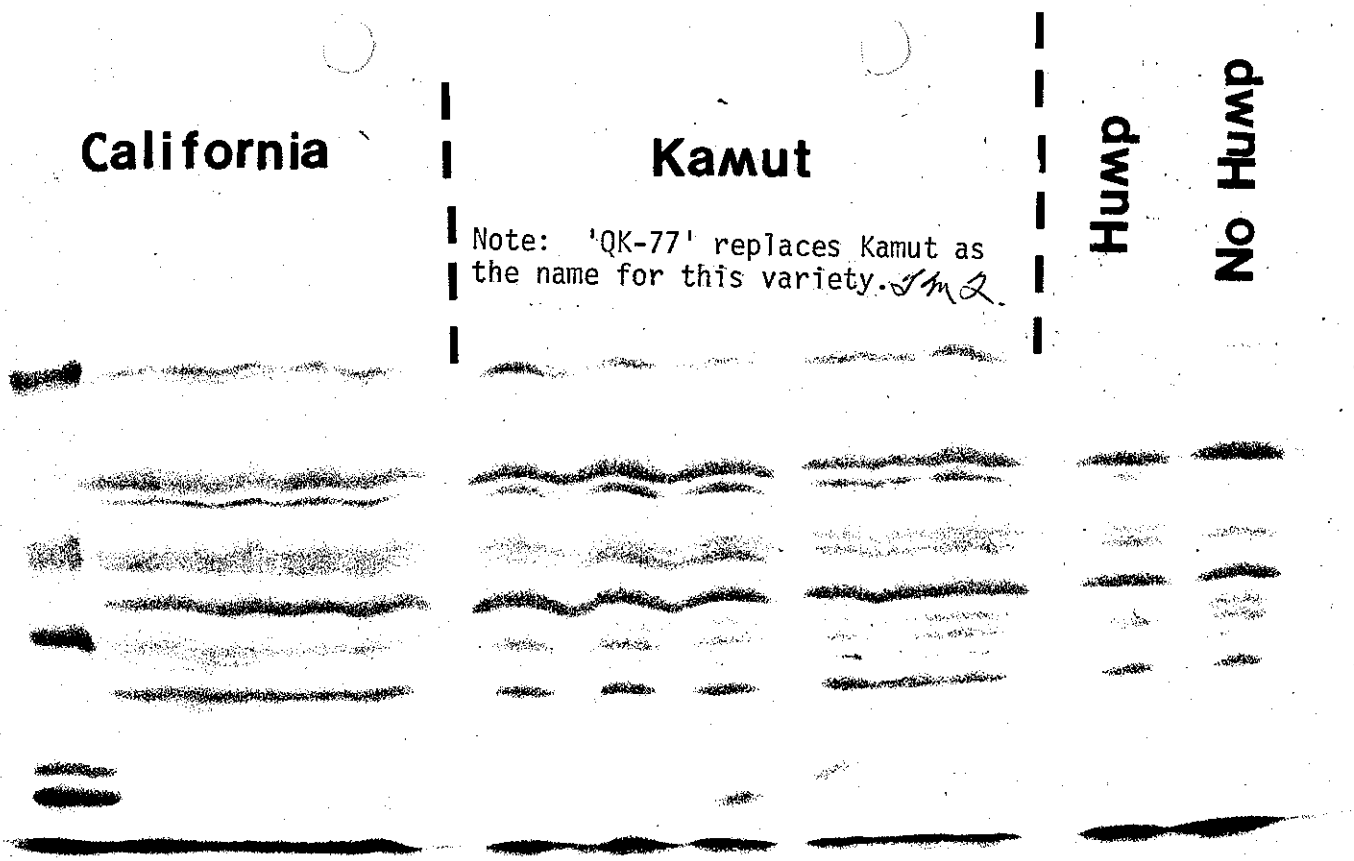


EXHIBIT B6

Thanks:

Note ① the extra band below the highest M.W. band in California vs. Kamut. This is repeatable.

② Hump and no hump are not the same - this is also repeatable.

Luther

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ROBERT M. QUINN
FERRY, P.O. BOX 808
BIG SANDY, MONTANA 59520

FORM APPROVED: OMB NO. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK AND SEED DIVISION
BELTSVILLE, MARYLAND 20705

EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY
WHEAT (*TRITICUM SPP.*)

INSTRUCTIONS: *See Reverse.*

NAME OF APPLICANT(S)
T. M. Quinn

ADDRESS (*Street and No. or R.F.D. No., City, State, and ZIP Code*)
Box 353
Big Sandy, MT 59520

FOR OFFICIAL USE ONLY
PVPO NUMBER

VARIETY NAME OR TEMPORARY DESIGNATION
'QK-77'

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. [0][8][9] or [0][9]) when number is either 99 or less or 9 or less.

1. KIND:
[5] 1 = COMMON 2 = DURUM 3 = EMMER 4 = SPELT 5 = POLISH 6 = POULARD 7 = CLUB

2. TYPE:
[1] 1 = SPRING 2 = WINTER 3 = OTHER (*Specify*) _____
[2] 1 = SOFT 2 = HARD 3 = OTHER (*Specify*) _____
[3] 1 = WHITE 2 = RED 3 = OTHER (*Specify*) polonicum

3. SEASON - NUMBER OF DAYS FROM EMERGENCE TO:
[0][6][0] FIRST FLOWERING
[0][6][8] LAST FLOWERING

4. MATURITY (*50% Flowering*):
[0][0] NO. OF DAYS *EARLIER* THAN later than all...
[0][2] NO. OF DAYS *LATER* THAN .....
[ ] [7] 1 = ARTHUR 2 = SCOUT 3 = CHRIS 4 = LEMHI 5 = NUGAINES 6 = LEEDS 7 = Newana

5. PLANT HEIGHT (*From soil level to top of head*):
[1][0][0] CM. HIGH
[2][8] CM. TALLER THAN ..... [7]
[0][0] CM. SHORTER THAN (taller than all) ..... [ ] 1 = ARTHUR 2 = SCOUT 3 = CHRIS 4 = LEMHI 5 = NUGAINES 6 = LEEDS 7 = Newana

6. PLANT COLOR AT BOOTING (*See reverse*):
[3] 1 = YELLOW GREEN 2 = GREEN 3 = BLUE GREEN

7. ANTHER COLOR:
[1] 1 = YELLOW 2 = PURPLE

8. STEM:
[1] Anthocyanin: 1 = ABSENT 2 = PRESENT
[2] Haininess of last internode of rachis: 1 = ABSENT 2 = PRESENT
[0][4] NO. OF NODES (*Originating from node above ground*)
[ ] Waxy bloom: 1 = ABSENT 2 = PRESENT
[1] Internodes: 1 = HOLLOW 2 = SOLID
[2][3] CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW

9. AURICLES:
[1] Anthocyanin: 1 = ABSENT 2 = PRESENT
[1] Haininess: 1 = ABSENT 2 = PRESENT

10. LEAF:
[1] Flag leaf at booting stage: 1 = ERECT 2 = RECURVED 3 = OTHER (*Specify*): _____
[2] Hairs of first leaf sheath: 1 = ABSENT 2 = PRESENT
[1][0] MM. LEAF WIDTH (*First leaf below flag leaf*)
[1] Flag leaf: 1 = NOT TWISTED 2 = TWISTED
[ ] Waxy bloom of flag leaf sheath: 1 = ABSENT 2 = PRESENT
[2][6] CM. LEAF LENGTH (*First leaf below flag leaf*):

11. HEAD:

[2] Density: 1 = LAX 2 = DENSE

[3] Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE 4 = OTHER *(Specify)* ____

[4] Awnedness: 1 = AWNLESS 2 = APICALLY AWNLETED 3 = AWNLETED 4 = AWNED

[7] Color at maturity: 1 = WHITE 2 = YELLOW 3 = PINK 4 = RED 5 = BROWN 6 = BLACK 7 = OTHER *(Specify)*: straw

[0][6] CM. LENGTH

[1][5] MM. WIDTH

12. GLUMES AT MATURITY:

[3] Length: 1 = SHORT *(CA. 7 mm.)* 2 = MEDIUM *(CA. 8 mm.)* 3 = LONG *(CA. 9 mm.)*

[3] Width: 1 = NARROW *(CA. 3 mm.)* 2 = MEDIUM *(CA. 3.5 mm.)* 3 = WIDE *(CA. 4 mm.)*

[6] Shoulder shape: 1 = WANTING 2 = OBLIQUE 3 = ROUNDED 4 = SQUARE 5 = ELEVATED 6 = APICULATE

[3] Beak: 1 = OBTUSE 2 = ACUTE 3 = ACUMINATE

13. COLEOPTILE COLOR:

[1] 1 = WHITE 2 = RED 3 = PURPLE

14. SEEDLING ANTHOCYANIN:

[ ] 1 = ABSENT 2 = PRESENT

15. JUVENILE PLANT GROWTH HABIT:

[3] 1 = PROSTRATE 2 = SEMI-ERECT 3 = ERECT

16. SEED:

[3] Shape: 1 = OVATE 2 = OVAL 3 = ELLIPTICAL

[1] Cheek: 1 = ROUNDED 2 = ANGULAR

[1] Brush: 1 = SHORT 2 = MEDIUM 3 = LONG

[1] Brush: 1 = NOT COLLARED 2 = COLLARED

[ ] Phenol reaction *(See instructions)*: 1 = IVORY 2 = FAWN 3 = LT. BROWN 4 = BROWN 5 = BLACK

[2] Color: 1 = WHITE 2 = AMBER 3 = RED 4 = PURPLE 5 = OTHER *(Specify)* ____

[1][0] MM. LENGTH

[0][3] MM. WIDTH

[7][5] GM. PER 1000 SEEDS

17. SEED CREASE:

[1] Width: 1 = 60% OR LESS OF KERNEL 'WINOKA' 2 = 80% OR LESS OF KERNEL 'CHRIS' 3 = NEARLY AS WIDE AS KERNEL 'LEMHI'

[1] Depth: 1 = 20% OR LESS OF KERNEL 'SCOUT' 2 = 35% OR LESS OF KERNEL 'CHRIS' 3 = 50% OR LESS OF KERNEL 'LEMHI'

18. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

[1] STEM RUST *(Races)* various

[1] LEAF RUST *(Races)* various

[0] STRIPE RUST *(Races)* ____

[0] LOOSE SMUT

[0] POWDERY MILDEW

[0] BUNT

[0] OTHER *(Specify)* ____

19. INSECT: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

[0] SAWFLY

[0] APHID *(Bydv.)*

[0] GREEN BUG

[0] CEREAL LEAF BEETLE

[ ] OTHER *(Specify)* ____

HESSIAN FLY RACES: [0] GP [0] A [0] B [0] C [0] D [0] E [0] F [0] G

20. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering		Seed size	
Leaf size		Seed shape	
Leaf color		Coleoptile elongation	
Leaf carriage		Seedling pigmentation	

INSTRUCTIONS

GENERAL: The following publications may be used as a reference aid for the standardization of terms and procedures for completing this form:

(a) L.W. Briggle and L. P. Reitz, 1963, Classification of Triticum Species and Wheat Varieties Grown in the United States, Technical Bulletin 1278, United States Department of Agriculture.

(b) W.E. Walls, 1965, A Standardized Phenol Method for Testing Wheat Seeds for Varietal Purity, contribution No. 28 to the handbook of seed testing prepared by the Association of Official Seed Analysts. *(See attachment.)*

LEAF COLOR: Nickerson's or any recognized color fan should be used to determine the leaf color of the described variety.

8900108 B2 D

NDSU

NORTH DAKOTA STATE UNIVERSITY

OF AGRICULTURE AND APPLIED SCIENCE
BOX 5728, UNIVERSITY STATION
FARGO, NORTH DAKOTA 58105

Department of Cereal Science and Food Technology
Harris Hall
Telephone: (701) 237-7711

October 27, 1988

Mr. Robert M. Quinn
Ferry Rt., PO Box 808
Big Sandy, MT 59520

Dear Bob

Enclosed please find the wheat, milling and pasta quality data for Kamut, the large kerneled durum that you sent to us from your 1987 crop. As we discussed by telephone, the only real deficiency in quality appears to be the relatively low level of yellow color, although that is not necessarily a negative factor in whole wheat pasta.

Dr. Khalil Khan, of our faculty, did gliadin electrophoregrams for Kamut and Polonicum wheat (supplied by Dr. Jack Carter) and has determined that their mobility patterns are identical. I believe Dr. Khan will supply photographs of the patterns to Dr. Carter who will then pass them on to you with some additonal information.

I hope this information is useful to you and wish you success in marketing Kamut.

Sincerely

Joel W. Dick

Joel W. Dick
Associate Professor

enclosures

st

cc Dr. Khalil Khan
Dr. Jack Carter

responded 11/7

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8900108
(45) DURUM2

DURUM WHEAT FIELD PLOT TRIALS

LAB NO.	STATION	VARIETY	TEST WT	VIT KER	1000 KER WT
87-3332	Montana Wheat	Kamut	61.0	99	67.6

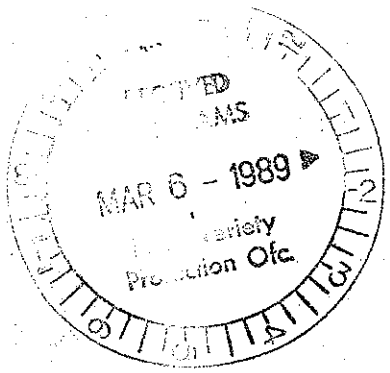
PROTEIN		TOTAL EXT %	SEMO EXT %	ASH		SPECKS
WHEAT	SEMOLINA			WHEAT	SEMOLINA	
14.7	13.5	70.7	50.5	1.49	0.67	50

		COOKED			KERNEL DIST			WHT		WET
SPAG COLOR	MIX	WEIGHT	LOSS	FIRMNESS	LG	MED	SM	MOIS.	FN	GLU.
8.0	6	30.7	7.3	6.2	81	19	0	10.4	738	39.7

MILLING DATE	08/30/88	BRAN	382	P-1 FINE	604
WHEAT MOISTURE %	9.4	FLOUR	340	P-2 FINE	368
WEIGHT	3000	SHORTS	79	P-3 FINE	536
H_2O @ 12.5%	106.3	DUST	423	P-4 FINE	214
H_2O @ 14.5%	72.7	TOTAL EXT	2138	P-4 INTER	67
H_2O @ 17.5%	115.6	TOTAL PRODUCT	3022	P-4 COARSE	9
PRE-MILL WEIGHT	3294.6	MILLING TIME	29:10	TOTAL SEMOLINA	1798

PROCESSING DATE	09/06/88
BATCH NO.	5
SEMOLINA MOISTURE	13.5
WEIGHT	900
WATER	244.9

COMMENTS: Mill feed gauge changed from 7 to 9.5 to get the large kernels through.



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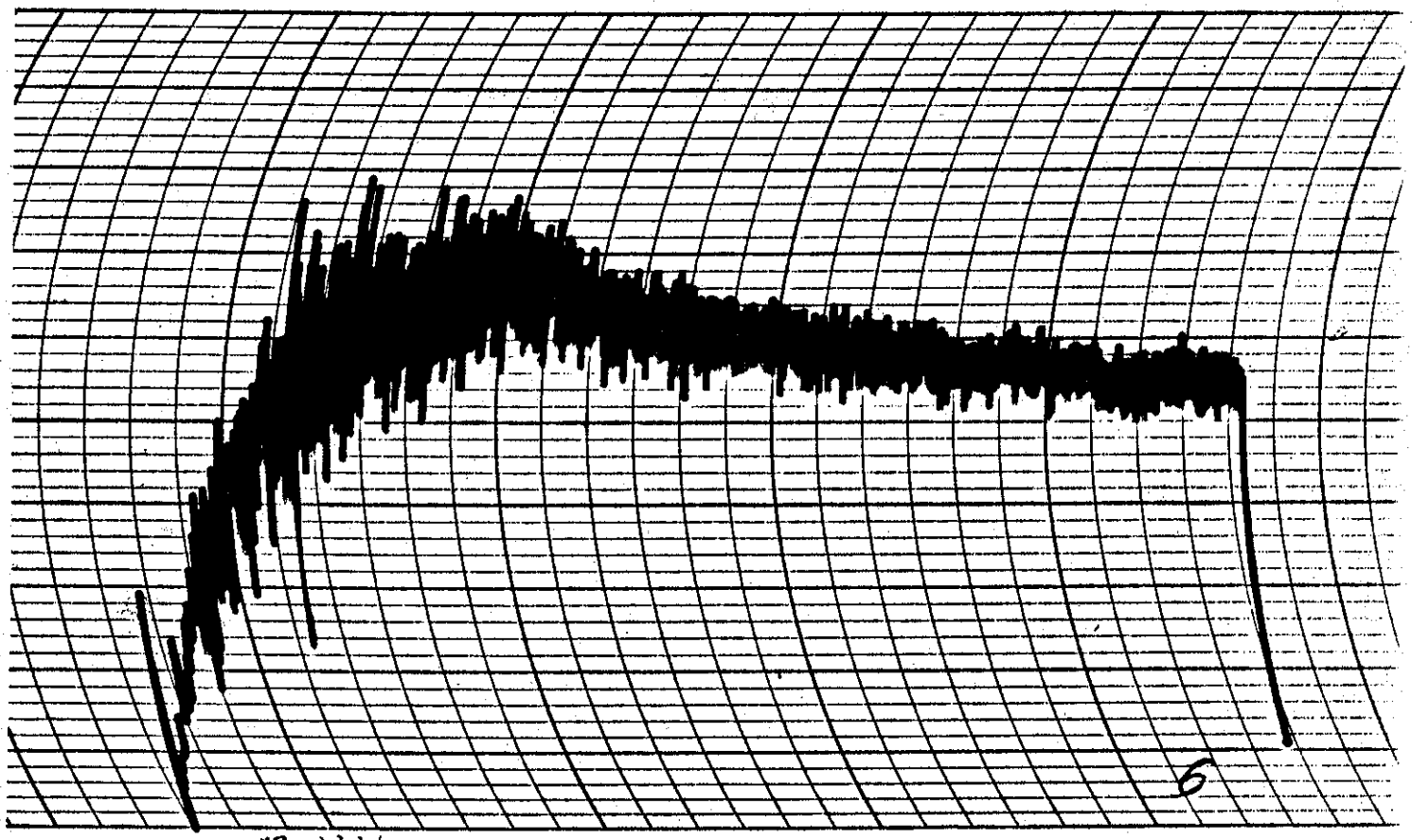

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B3 D

Royal-Angelus Macaroni Company
A Division of Provena Foods

ROYAL BRANDS

Over a Century of Tradition

2/7/89

MONTANA FLOUR & GRAINS
Ferry Rt. P.O. BOX 808
Big Sandy, MT. 59520

Dear Bob,

We have been making pasta products with your Kamut Durum flour for the past year and we have found it to work well throughout our complete pasta operation. It machines well, has exceptionally good characteristics, and has less tendency to checking. The finished product is far more superior then regular Durum Whole Wheat pasta. Cooks Al Dente.

I hope you continue to grow and mill this fine product.

I remain yours truly,

Lou Arena, Sr.
Vice Pres./Marketing

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Attachment to Application for Plant Variety Protection Certificate
(Form GR-470) (Applicant: T. M. Quinn)

EXHIBIT E

T. M. Quinn developed 'QK-77' by specific selection from a handful of grain given to him by a friend in 1977. The original source, reportedly from Egypt, was brought to America in 1949, and was not from a named or public variety or from a public or private germplasm source. The selection was made in 1978 and has had no variants in the crops raised from it since that time.